IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Keith J. Brodie

Application No. 10/600,190

Filing Date: June 20, 2003

For: Global Positioning Tag System and Method

Examiner: Ronnie M. Mancho

Art Unit: 3663

Attorney Docket No.: M-15536-3C US

APPELLANT'S AMENDED OPENING BRIEF

Real Party In Interest

The real party in interest is SiRF Technology, Inc., the present assignee of US Application No. 10/600,190.

Related Appeals and Interferences

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1 – 8 are pending and are at least twice rejected.

Claims 9 – 42 are cancelled.

The rejection of claims 1 – 8 is appealed.

Status of Amendments

Subsequent to the final rejection of March 21, 2007, an amendment was filed in the response of July 23, 2007 and entered by the examiner. An amendment is submitted with this appeal under 37 CFR 41.33 that amends claim 1. The 37 CFR 41.33 amendment has not yet been entered by the examiner.

Summary of Claimed Subject Matter

The claimed subject matter relates to satellite-based positioning systems used to determine the position of an object. There is only one independent claim (claim 1).

As discussed in the background section of the specification, it is desirable to develop low-cost solutions to track objects such as unmanned vessels. Applicants have provided a system that is reliable and minimizes data transmission to conserve power. As shown in Applicant's Figure 1, an interrogator (element 12) interrogates one or more transponders (also denoted as tags 16) to determine the location of the transponders. To assist the transponders, the interrogator receives GPS signals so as to perform certain pre-

location-determination calculations so that the interrogator may then transmit corresponding pre-positioning data to the transponders. As discussed, for example, on page 12, lines 8-18, the interrogator determines an approximate Doppler shift and code phase for the transponders. As discussed, for example, on page 6, lines 5-8, the interrogator sends to the transponders a "correlation snapshot message" that identifies a pseudorandom noise (PRN) code number (corresponding to a given satellite), chip number (code phase), Doppler offset, reference time, and frequency information. Such features are reflected in claim 1, which recites: "an interrogator remote from the object and including circuits that: receive GPS signals from GPS satellites; for one of the satellites associated with the GPS signals, transmit pre-positioning data for the GPS satellite, including a pseudorandom noise (PRN) code number, a Doppler frequency offset and a code phase offset and a tracking signal including reference time and frequency information." The support for such a feature is as discussed above on page 12, lines 8-18 and page 6, lines 5-8.

The transponder uses the transmitted data from the interrogator to form a "correlation snapshot." As discussed on page 9, lines 3-18, the transponder uses the reference time and frequency information in the tracking signal to lock its oscillator while forming the correlation snapshot. As discussed, for example, on page 9, lines 25 through page 10, line 9, the correlation snapshot is a sampled coarse acquisition (C/A) code correlation function between the received GPS signal and a replica of such a signal generated by the transponder at regular offsets of some fraction of a chip over the range of at least a full chip (with respect to the chip offset and Doppler commanded by the interrogator). The transponder transmits the resulting correlation snapshot to the interrogator as discussed on, for example, on page 10, lines 24-26. Such features are reflected in claim 1, which recites a "a transponder positioned on the object and including circuits that: receive the pre-positioning data and the tracking signal; collect RF samples of the GPS signals; correlate the RF samples of the GPS signals against replicas of a GPS signal based on the PRN code number, the Doppler frequency offset, the code phase offset in the prepositioning data, and

the reference time and frequency information in the tracking signal to produce the correlation snapshot" as supported by page 9, lines 3-18 and page 9, lines 25 through page 10, line 9. In addition, claim 1 further limits the transponder to "transmit the correlation snapshot to the interrogator" as supported by page 10, lines 24-26. The correlation snapshot that is thus received by the interrogator includes correlator sums and a range offset in chips as also discussed, for example, on page 10, lines 24-26. Claim 1 reflects such a feature by reciting (with respect to the received correlator snapshot) the limitation of "wherein the correlation snapshot comprises correlator sums and a range offset in chips" as supported by page 10, lines 24-26.

The interrogator uses the received correlation snapshot to determine a pseudorange as discussed, for example, on page 10, lines 27-28. Such a feature is reflected in claim 1 by limiting the interrogator to include circuits that "determine a pseudorange associated with a received correlation snapshot" as supported by page 10, lines 27-28.

Grounds of Rejection to Be Reviewed on Appeal

1) Whether, under 35 U.S.C. § 112, first ¶, claims 1-8 fail to comply with the written description requirement.

2) Whether, under 35 U.S.C. § 112, second ¶, claims 1-8 are indefinite.

3) Whether, under 35 U.S.C. § 102(e), claims 1-3 and 8 are anticipated by Krasner (USP 5,781,156).

Argument

Claims 1 – 8 have been improperly rejected as failing to comply with the written description requirement despite abundant support in the specification for the claimed subject matter of independent claim 1.

The use of "correlator sums" in claim 1 is not new matter as asserted in the October 5, 2007 office action. It is true, that in an isolated instance in the specification (with regard to a specific embodiment), the Applicant did note that correlator sums are transmitted to the interrogator as "fixed point values" as stated on page 9, line 29. But the very same page of the specification rebuts any such additional limitation – for example, in the paragraph starting on line 19 of page 29, the Applicant describes the transmission of correlation sums to the interrogator and in no way demands or requires that such sums be formed using only fixed point values. Moreover, the plain disclosure by the Applicant of "correlator sums" in this paragraph flatly contradicts the observation in the 10/05/07 office action that "the original disclosure does not recite the phrase." Finally, Applicant notes that this rejection is improper under MPEP 2163.04. As noted in MPEP 2163.04, the burden is on the examiner to show why "a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims." Here, all the examiner has done is seize upon the description of a particular embodiment and thus fails to meet such a burden with regard to claim 1.

Similarly, the use of "standby circuit" in claim 5 is also not new matter. As described on the specification on page 8, lines 3-7, the transponders have a standby mode of operation. This mode was not described as a "passive" standby mode. Those skilled in the art will appreciate that, to enable a standby mode, some sort of standby circuit is necessary to stay awake during the standby mode so that the transponder may awake and resume normal operation. It is true that such a standby circuit was described as a "passive standby circuit" in the specification. However, the examiner has not met his burden under MPEP

2163.04 because the standby mode was not described or limited to be a "passive" standby mode.

Claims 1-8 are not indefinite because the recitation of "range offset in chips" in claim 1 has a well-known meaning in the GPS arts.

As known in the GPS arts, the bits in the PRN sequence transmitted by the GPS satellites are often denoted as "chips" since they are not used to transmit data: a satellite's PRN sequence doesn't change and is repeated over and over since the inception of the GPS system. See, e.g., USP 7,142,589, Col. 5, lines 61 through Col. 5, line 20. Thus, there is no data being transmitted by the chips – they instead are used in a correlation to determine range. The satellite transmits the PRN sequences but they take a certain amount of time to reach a GPS receiver as determined by the speed of light in space and through the atmosphere. It is this transmission time that determines the range (denoted as a psuedorange because of clock offsets) between the satellite and the receiver. That is the core idea of GPS: the receiver determines this time according to the transmitted chips through correlation. By correlating the received PRN sequence with an internally-generated PRN sequence, the receiver determines a "range offset in chips." The location of a receiver may then be determined through the use of the resulting pseudoranges. Thus, the claim term "range offset in chips" is abundantly well-known in the art.

The Krasner reference cannot anticipate claim 1 because the Krasner mobile units do not satisfy the limitations of the recited transponder and because the Krasner base station does not satisfy the limitation of the recited interrogator.

As seen in Figure 1A of Krasner, a cellular base station transmits Doppler shift to mobile units. The mobile units then either respond with their location (full GPS capability) or with their pseudoranges (partial GPS capability). Claim 1 is directed to a starkly different system: the transponder cannot calculate its position or pseudorange. Instead, the transponder in claim 1 transmits "a correlation snapshot" to the interrogator as discussed above. Moreover, the

Krasner mobile unit does not receive a code phase offset from the base station. In sharp contrast, the claimed interrogator transmits a code phase offset to the transponder. As discussed in the specification on page 12, lines 7-18, the transponders are relatively close to the interrogator such that the interrogator can predict the code phase that the transponder will see. In sharp contrast, the Krasner mobile units may be up to 150 km from the base station (Col. 5, lines 1-4). Thus, there is no suggestion in Krasner for the base station to transmit a predicted code phase to the mobile units. In that regard, Applicants note that the observation on page 10 of the 10/5/07 office action (that "Krasner anticipates the invention since applicant admits that the approximate positions of the mobile units are known as indicated in the arguments") is without merit: the Krasner base station does not know the approximate positions of the mobile units in any fashion.

Therefore, in light of the foregoing arguments, Applicants respectfully request the Honorable Board of Appeals to reverse the decision of the Examiner with respect to claims 1 through 8.

Respectfully submitted,

Date: January 14 2008

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Claims Appendix

1. A communications system for determining the position of an object, said system comprising:

an interrogator remote from the object and including circuits that:

receive GPS signals from GPS satellites;

for one of the GPS satellites associated with the GPS signals, transmit pre-positioning data for the GPS satellite, including a pseudorandom noise (PRN) code number, a Doppler frequency offset and a code phase offset and a tracking signal including reference time and frequency information; and

determine a pseudorange associated with a received correlation snapshot, wherein the correlation snapshot comprises correlator sums and a range offset in chips; and

a transponder positioned on the object and including circuits that receive:

receive the pre-positioning data and the tracking signal;

collect RF samples of the GPS signals;

correlate the RF samples of the GPS signals against replicas of a GPS signal based on the PRN code number, the Doppler frequency offset, and the code phase offset in the prepositioning data and the reference time and frequency information in the tracking signal to produce the correlation snapshot; and

transmit the correlation snapshot to the interrogator.

2. The system of claim 1 wherein the transponder comprises a two bit sampler for collecting the RF samples.

3. The system of claim 1 wherein the interrogator is further adapted to transmit a wake-up signal prior to transmitting the pre-positioning data and the tracking signal, and the transponder comprises:

processing circuitry; and

a power subsystem adapted to maintain the processing circuitry in a power-off mode prior to receipt of the wake-up signal.

4. The system of claim 3 wherein the wake-up signal comprises an unmodulated carrier transmitted at a higher power than the pre-positioning data and the tracking signal.

5. The system of claim 3 wherein the power subsystem comprises:

a switch connected to a receiver adapted to receive the wake up signal;

a standby circuit connected to the receiver through the switch; and

a power supply control adapted to provide power to the processing circuitry and to be switched on and off by the standby circuit.

6. The system of claim 5 wherein the standby circuit comprises:

a low pass filter connected to the receiver and adapted to output a voltage, the voltage increasing as a function of time in response to receipt of an RF signal at the resonant frequency of the low pass filter by the receiver; and

a comparator adapted to compare the output voltage to a threshold voltage and to trigger the power supply control an "on" mode when the output

voltage is greater than the threshold voltage.

7. The system of claim 5 wherein the standby circuit comprises:

three passive tuned filters, each connected to the receiver, two of the passive tuned filters being adapted to detect continuous wave tone signals and a third one of the passive tuned filters being adapted to measure the noise and interference in the band of interest, each further adapted to output a corresponding voltage; and

a pair of comparators adapted to combine the three output voltages, compare the result to a threshold voltage and to trigger the power supply control on when the result is greater than the threshold voltage.

8. The system of claim 1 wherein the code replicas are generated by the transponder at regular offsets of some fraction of a C/A code chip.

Evidence Appendix

None

Related Proceedings Appendix

There are no decisions rendered by a court or by the Board in any of the related proceedings.